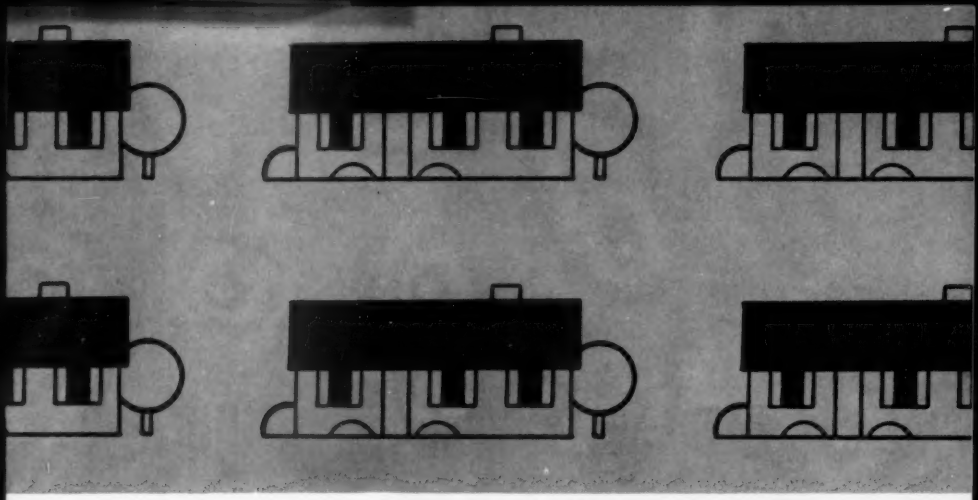
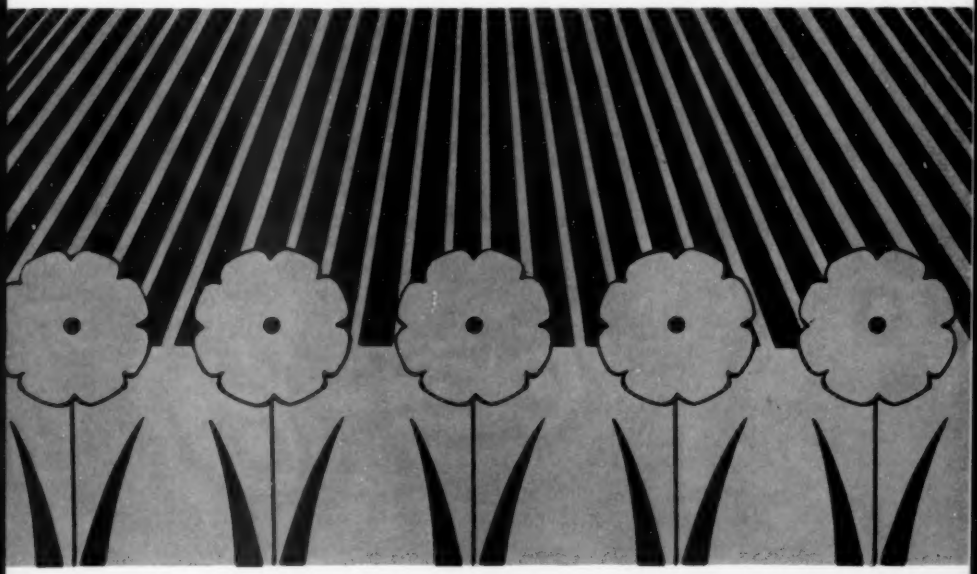


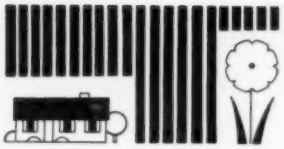
NEW YORK STATE COLLEGE OF AGRICULTURE CORNELL EXTENSION BULLETIN 1049



SUBURBAN GARDENING

FLOWERS • VEGETABLES • SHRUBS AND TREES • FRUITS • LAWNS

SUBURBAN GARDENING



Every year many home owners have their first opportunity to enjoy gardening. This bulletin is designed to give these people information on soils and fertilizers, annuals, perennials, trees and shrubs, lawns, vegetables, and fruits, and to help the gardener plant and take care of his property.

As their experience grows, home gardeners will undoubtedly introduce a wider variety of plants into their gardens. Additional information[1] on plants and gardening methods of a more complicated nature is available to help you develop home gardening as an enjoyable and pleasant recreation.

BASIC RECOMMENDATIONS FOR HOME GARDENERS

Plan Before You Plant

Good planning helps produce good landscaping. As a new home owner, consider the entire property before doing any permanent landscaping. Survey your property by pacing off the distances between major existing features, and marking them on a map of the property.

Assign areas to meet personal needs and desires. These areas should include a neat, attractive area for recreation or entertainment; adequate space for garbage, drying clothes, and tool storage; space for vegetable and flower gardens; and a foreground area to display the house to good advantage. Stake out the private and service areas and test them for size and space requirements. Mark key locations where plants head-high or taller can be used to advantage for screen, shade, or purposes of appearance.

[1] Much of the information in this bulletin has been summarized from other publications of the New York State College of Agriculture.

Now you are ready to consider construction materials (for fences or walks) and plants (trees, shrubs, ground covers, annuals, perennials, or bulbs) that you may want to use to meet the requirements of the areas and to develop a pleasant landscape picture.

The order to follow in developing the landscape plantings, the lawn, and the garden will depend somewhat on the time of year when the work is to be done, and whether the property is new and completely devoid of landscaping, or has some plantings that need reorganizing.

Select Good Garden Sites

A well-drained soil devoid of quackgrass, and located to receive at least six hours of direct sunlight is necessary for vegetables, fruits, and flowers.

Avoid low areas where water tends to collect or the soil remains soggy in the spring or after rains. Do not plant on subsoil fill, or close to large trees or shrubs that may rob the garden plants of nutrients and moisture.

Coarse, sandy soil that dries out rapidly is satisfactory if the soil is properly prepared and water is available for irrigation. Because few home properties can entirely fulfill these requirements, modification of the soil and proper selection of suitable, easy-to-grow plants are essential.

Prepare The Soil

Poorly drained soils can be improved by putting in tile drains about two feet below the surface, provided there is a way to carry off the drainage water. This is important to provide an adequate depth of well-drained soil for permanent plants such as trees and shrubs.

Organic matter. Organic matter is beneficial in loosening the soil, and improving the structure of heavy clay soils. Organic matter is of value on medium and light sandy soils because it helps to hold moisture and nutrients.

Sources of organic matter are peat moss, plant residues, compost, manures, sawdust, and corncobs. Extra fertilizer must be added if the last two materials are used.

Soil reaction. Most plants grow best in soils with a pH range of 6.0 to 7.0. Whether the soil pH is too low (too sour) or too high (too sweet) can be determined by a simple soil-reaction test. Moss or a green color on the ground are not definite indications that soil is too acid. Apply lime to garden soils when a test shows the pH is below 6.0.

Fertilizers. Vegetable, fruit, and ornamental plants need nitrogen, phosphorus, and potassium available in the soil. These elements are supplied in commercial complete fertilizers. Commercial fertilizers bear a label that gives the analysis, such as 5–10–5. A 5–10–5 fertilizer, for example, contains five percent nitrogen, ten percent phosphoric acid, and five percent potash.

Actual soil preparation. Yearly soil preparation is the same for both vegetable and flower gardens. Spread organic matter such as peat moss or rotted stable manure on the soil at the rate of two bushels per 100 square feet. Use poultry or sheep manure at half this rate.

Apply a 5–10–5 fertilizer at the rate of four pounds per 100 square feet of garden area. If manure is used, apply two pounds of 5–10–5 fertilizer. Other complete fertilizers can be used in proportionate amounts.

Apply half of the fertilizer before turning over the soil and the other half immediately after. After application of organic matter and fertilizer, turn the soil over with a shovel, or a mechanical tiller, to a depth of six or eight inches as soon as the soil is dry enough to be friable. A good test is to mold a handful of soil into a ball. If it is not sticky, but crumbles readily, it is in a condition to be worked.

Subsequent fertilization, when recommended, is made by a light application of dry fertilizer, or a fertilizer solution, along the row. To make a solution, stir vigorously four level tablespoons of a 5–10–5 fertilizer in a gallon of water until most of the fertilizer has dissolved or is in suspension. Special readily soluble fertilizers that dissolve completely are on the market; use at the rates recommended by the manufacturer. Fertilizer solution is recommended for a flower border that may have a combination of annuals, perennials, and bulbous plants which make it difficult to apply dry fertilizer between the plants. Dry fertilizer on the leaves causes leaf injury.

Maintain the Garden

Most plants, except weeds, do not grow well unless they are given a minimum amount of care. Watering is important during periods of drought. A thorough weekly soaking is preferable to a light sprinkling each night.

Shallow cultivation with a hoe or cultivator to cut off seedling weeds improves the general appearance of any planting and removes competitors for nutrients and moisture. Deep loosening of the soil is not necessary and usually cuts off the plant roots. Mulches of sawdust and black plastic control weeds, conserve moisture, and help keep the soil surface in good shape for absorbing moisture.

Stake tall flowering plants early during their growth to prevent damage from heavy rains and winds. The fall cleanup after foliage has been killed by frosts reduces possible overwintering of insects and diseases.

Regular use of a dual purpose spray or dust also helps keep disease and insect troubles to a minimum. Sprays are preferable. See recommendations on page 9 for vegetables. For annual and perennial flowering plants, a similar combination may be used; many of the satisfactory commercial preparations have D.D.T. substituted for the methoxychlor, and captan for the zineb. Spray or dust once a week. A small hand rotary duster is easy

to use and is effective. *Keep chemicals out of reach of children and pets.*

These tasks are not arduous, but are highly rewarding. A spade, shovel, trowel, hoe, and duster or sprayer are the essential tools. A hand push cultivator is helpful for weeding, especially in the vegetable garden.

FLOWERS

Annuals

Annuals are plants that live from late spring until the first frost of the following autumn. Because annuals are frost-sensitive, plant them in the garden after the danger of the last frost in your locality.

Annuals start blooming early in the season and provide color all summer. Most annuals are relatively shallow rooted, and therefore can be grown in some of the locations where the topsoil is shallow or soil drainage is not good enough for perennials. On new home properties, annuals are effective

Table 1. Easy-to-Grow Annuals

Common name	What to plant *	Height (inches)	Color	Remarks on summer flowering
Ageratum	P	12–18	Blue	All summer
Sweet alyssum	P S F	4–6	White, violet	All summer
California poppy	S F	12	Orange, yellow	Short period
Cornflower, bachelor's button †	P S F	24	Blue, rose, white	Short period
Candytuft (annual) †	P S F	12	White, lavender, crimson	Short period
Geranium	P	9–18	Red, white, pink	All summer
Marigold—French †	P S	15	Orange, yellow, red	All summer
Marigold—African †	P S	24–30	Orange, yellow	Late summer
Petunia	P	12–18	White, pink, red, purple	All summer
Phlox (annual) †	P S	12	Red, purple, white	All summer
Portulaca	P S	6–8	Rose, red, yellow, white	All summer
Rudbeckia †	P S	24	Yellow	Middle of summer
Salvia	P	15–24	Red	All summer
Zinnia †	P S	20–30	Various (no blue)	All summer

* P–plants; S–seeds sown in garden in spring; F–seeds sown in fall
† Good for cut flowers

in providing color and home decoration the first season while the more extensive landscape work is being started.

Plant shorter varieties in front of the taller ones. Do not scatter individual plants of one variety or color throughout the planting; obtain a pleasing effect by planting five to seven plants of a variety or color in a group.

Seed of some annuals, listed in table 1, can be sown in the garden where the plants are to bloom. If the plants come up too thick, thin them to a spacing of six to ten inches by pulling some as soon as the plants have four true leaves and you can tell them from the weeds.

Plants from seed sown directly in the garden in the spring do not bloom until mid or late summer. Some, such as bachelor's button, candytuft, cleome (spider plant), and larkspur can be sown in the autumn of one year and bloom a little earlier than seed sown in the spring of the following year.

To have flowering plants from early summer to fall, use small plants that have been started in pots, flats, or some other container at commercial greenhouses. Remove plants from the pots or flats and set them in the garden slightly deeper than they were in the original container.

Starting annual plants from seed in the house is not recommended because the plants usually are spindly and weak as the result of insufficient sunlight, temperatures higher than 60°F., and improper watering.

The annuals listed in table 1 are much easier to grow and are more satisfactory than others. As you gain gardening experience, you may wish to try some of the more difficult annuals.

Perennials

Perennials are plants that will survive through winter for at least three years or more. Survival ability depends on the type of plant, drainage conditions of the soil, winter protection, and severity of the climate. Perennials bloom each year without replacement, and have types of flowers not available as annuals. A disadvantage, however, is that most perennials do not bloom continuously throughout the summer season. A combination of annuals with perennials takes care of this problem.

There are hundreds of perennials, but it is best to start with a few basic ones listed in table 2 and add more as one gains gardening experience.

Because perennials will be in place for several years, good soil preparation as outlined on pages 3 and 4 is essential before planting. Prepare well-drained soil to a depth of 10 to 12 inches.

During the growing season, cultivate the soil lightly to a depth of one inch. Weeds often must be pulled by hand. A three-inch mulch of peat moss conserves moisture and helps to keep down weeds. Water during the summer if the soil becomes dry. To fertilize, apply about a half cup of 5–10–5 commercial fertilizer on the soil around the plant and cultivate it into the soil surface, or water the soil thoroughly with a fertilizer solution.

In general it is advisable to grow the common perennials that do not require mulch for winter protection. In areas of severe climate, or for the more tender perennials, put a mulch of loose straw, salt hay if available, or evergreen branches on the perennial bed in the fall after the ground has frozen (usually late November) to reduce winter injury. A dense mulch of leaves may smother the plants. Remove the mulch in the spring (March or early April) before growth starts.

Table 2. Perennials and Bulbs

Perennials

Name	Time of bloom	Height (feet)	Color	Time of planting or dividing clumps	Distance between plants (feet)	Time of annual fertilizing
Iris, bearded or German	May–June	3	Various	Early July after flowering	1½–2	Early spring or after flowering
Peony, common.	late May–June	3½	Red, pink, white	September–October	4–5	After flowers have faded
Hemerocallis (daylily)	June–September according to variety	2–4	Yellow, orange, red	Right after flowering	3	Early spring or right after flowering
Chrysanthemum (garden types)	August–September	3	Various	Spring	1	Before planting and early August
Phlox	July–August	3	Pink, red, purple, white	Spring	2	Early spring

Bulbs and Corms

Name	Time of bloom	Height (feet)	Color	Depth of planting* (inches)	Spacing between bulbs (inches)
Snowdrop	March	½	White	2	2–3
Crocus	April	½	Purple, white, yellow	2	4
Hyacinth	April	1	Blue, pink, white	4	6
Grape Hyacinth	April–May	½	Blue, white, purple	2	4
Daffodil	April–early May	1½	Yellow, white	4	8
Tulip	May	2½	Various	4	8
Gladiolus	Late July–September	3–4	Various	4–6	6–8

* inches from soil surface to top of bulb

Specific information on planting, disease and insect control of these perennials is available from your agricultural extension service.

Bulbs and Corms

Bulbs. Hardy bulbs exceed all other groups of plants in producing color in the spring. Most bulbs do well the first year regardless of where planted, but do poorly after that unless they have at least six hours of sunlight per day and good soil drainage. Plant bulbs in October or November as given in table 2. For naturalized planting space narcissus bulbs at least ten inches apart and smaller bulbs about twenty to the square foot. Be sure the bulbs are right side up. Usually the upper part of the bulb is pointed. Remove seed pods from the plants after flowering. Do not remove the leaves until they turn yellow.

When the plants become crowded or when flowering decreases, bulbs should be dug, divided, and replanted after the foliage turns yellow. Or bulbs can be dug, washed, dried in a shaded, airy place and stored in shallow boxes in a cool, dry, well-ventilated place until planting time in the fall.

Gladiolus plants are somewhat stiff and formal for use in the general flower border, but may be used in clusters of three or four plants. Usually gladiolus bulbs (actually corms) are grown for cut flowers in rows in the vegetable garden. Make the first planting as soon as the soil is dry enough but not earlier than first signs of growth of trees. Make successive plantings at two-week intervals until June 15. Obtain details of thrip control and corm storage from your extension service.

VEGETABLES

The most popular and satisfactory vegetables for small gardens are listed in table 3.

The cool season crops, lettuce, broccoli, carrots, and beets withstand light freezes and can be planted as early as the ground can be prepared.

Replant in mid-summer for a fall crop. In fact, broccoli, carrots, and beets usually develop better quality in the fall. Other vegetables in table 3 are warm season crops and should be planted after danger of frost is past. Sow the larger seeds one to one and one-half inches deep, the smaller ones one-half to three-fourths inch deep. Two or more plantings of corn and beans can be made at about three-week intervals. It is better to plant corn in three short rows than in one long row. One planting of tomatoes (an early and a late variety) and cucumbers will suffice. Obtain plants and seed from local florists and nurseries, garden stores, or supermarkets. Dusting seeds with arasan or captan will reduce seed rot and damping off.

After the seeded crops are up and growing, thin them to the plant spacings shown in the table. Start using leaf lettuce, beets, and carrots while they are young and do some of the thinning as the crops are harvested. The other vegetables should be harvested at the prime condition for eating.

Apply a prepared dual purpose spray or dust each week as directed in table 3. A suitable spray mixture can be made up of malathion E.C.[2], methoxychlor W.P.[3], and zineb W.P., using one and one-half teaspoons, two and one-half level tablespoons, and two level tablespoons respectively in one gallon of water for approximately 400 square feet of garden area. Dust mixtures containing these materials are usually commercially available. Apply sufficient spray or dust to wet or cover both sides of the leaves thoroughly. *Caution — keep these chemicals out of reach of children and pets.*

SHRUBS AND TREES

The selection of major permanent trees and shrubs and proper soil preparation are important. You may need the advice of a landscape nurseryman, landscape architect, or other qualified personnel.

Most shrubs and trees grow best in a fertile, well-drained loam that is moist at planting time. Light and overdrained sandy or gravelly soils, and

[2] E.C.—emulsifiable concentrate
[3] W.P.—wettable powder

Table 3. Planting and Spacing Information for Vegetables and Fruits

Crop	What to plant	Seeds per foot of row	When to plant	Row spacing (inches)	Plant spacing in row (inches)	Amount to plant (ft. of row)	Spray or dust program	
							What for	When to start
Tomatoes	Plants	—	May 15–June 10	60	24–36	10–20	Anthracnose Early blight	After first blossom
Snap beans	Seeds	12	May 15–June 30	30	2	15–25	Bean beetle	Evidence of beetles
Lettuce, leaf	Seeds	20	Apr.; July–Aug. 15	30	2–3	10–20	Not needed	
Broccoli	Plants	—	Apr.; June; July	30	12	10–20	Aphids, worms	After transplanting
Beets	Seeds	18	Apr.–July 15	15 or 30	1–2	10	Not needed	
Carrots	Seeds	25	Apr.–June	15 or 30	½–1	10–15	Not needed	
Sweet corn	Seeds	3	May 15–June 30	30	10–12	50–100	Not needed	
Cucumbers	Seeds	4	May 25–June 10	60	12–15	5–10	Beetles and wilt	At emergence
Strawberries	Plants	—	Apr.–May 15	60	18–24	25	Usually not needed	
Red raspberries	Plants	—	Apr.–May 15	72	36	30	Usually not needed	
Grapes	Plants	—	Apr.–May 15	72	120	60	Usually not needed	

Varieties

Tomatoes: *Early*—Fireball, Valiant
Main season—Moreton Hybrid, Glamour, Manalucie*
Snap beans: Tendercrop, Tendergreen, Topcrop
Lettuce, leaf: Salad Bowl, Grand Rapids, Parris Island Cos
Broccoli: *Early*—Green Mountain, Italian Green Sprouting
Fall—Waltham 29
Beets: Crosby Green Top, Detroit Dark Red
Carrots: Nantes, Red Cored Chantenay
Sweet corn: *Early*—Golden Beauty, Carmelcross
Main season—Seneca Chief, Wonderful
Cucumber: Marketer, Burpee Hybrid, Surecrop Hybrid
Strawberries: Sparkle, Empire, Catskill, Premier
Red raspberries: September, Newburgh, Taylor
Grapes: Concord, Fredonia, Worden, Portland

* Manalucie is good only on Long Island.

heavy clayey, poorly drained soils, and shallow soils (less than two feet deep), are not satisfactory for shrubs and trees unless corrective measures such as adequate soil preparation, tile drainage, or raised beds are used. In such areas, plantings should be restricted to annual flowers or to the limited kinds of plants that survive in soils of this type in New York State climate.

Planting

Plant in spring when soils are moist but workable and warm (45° F. or more). The soil preparation and planting operation are governed by the type of original soil and the drainage conditions.

Well-drained loam soil. Dig a hole or pocket large enough to allow the roots to be spread out completely if the shrub or tree is a bare root plant. For balled and burlapped plants, have the hole twice the diameter of the soil ball. For most shrubs the hole should be 24 to 30 inches deep; for trees 36 to 44 inches. The wider and deeper the hole, the better the plant growth.

Mix one part by volume of peat moss with an equal volume of the soil dug out in preparing the hole for the plant. Leaf compost or well-rotted manure may be substituted for the peat moss. Put ten inches of the soil-peat mixture in the hole, then set in the shrub or tree and place some soil over the roots or around the soil ball. Tamp it firm (but not hard) or add some water to settle the soil over the roots. Then fill the hole with the soil-peat mixture. Firm the soil and make a cup-like area on top so water will flow in toward the plant. Water the soil and put on a mulch of three inches of peat moss. Water once a week throughout the first spring and summer. Do not apply fertilizer to newly planted shrubs and trees.

For established shrubs apply 5–10–5 fertilizer at the rate of two pounds per 100 square feet of garden area each year in spring when first growth appears. For trees up to three inches in trunk diameter (at a point four and one-half feet above the ground), apply two pounds of 5–10–5 fertilizer per inch of trunk diameter. For trees more than three inches in diameter, apply five pounds per inch of trunk diameter. This is excessive for lawn areas. Split the application and water it in on lawns. Fertilizers may be broadcast or injected into the soil at 18-inch intervals to a depth of 8 to 18 inches for deciduous plants (to eight inches for evergreen plants) starting two and one-half feet from trunk.

Sandy, gravelly, overdrained soils. For backfill around the plant, haul in a fertile loam soil or use a soil mixture of one-third, by volume, loam soil, one-third peat moss, and one-third original sandy soil.

Heavy clay, poorly drained soils. If soil is poorly drained and water remains within two feet of the surface for periods of several weeks during late winter or spring, plant roots will die from lack of air. Put tile drainage below the plants to carry away excess water. When this is not possible,

plant the shrubs or trees in raised areas or beds by building up a layer of well-drained material over the present existing surface. Bring in a well-drained loam or use a mixture of two parts, by volume, of soil and one part of peat moss or leaf compost to make a bed of soil two feet or more deep for shrubs, and more than three feet deep for trees. Make the raised bed three feet or more in width for a shrub and six to fifteen feet or more for a tree. For single plants, place a wall around the raised bed to prevent washing of soil; for groups of plants or large areas, the outer edges may be sloped to the original soil level. Plant the shrub or tree in the raised bed rather than in the original ground, in a manner similar to that already outlined.

Pruning

Prune only to improve appearance. Remove dead and diseased wood.

Deciduous plants (plants that lose leaves in winter) should be pruned between February 1 and May 1. Do not prune semi-hardy trees such as ornamental cherry and peach from November to January. During summer months prune elm, birch, beech, and maple, which exude sap in the spring.

Narrowleaf evergreen shrubs and trees such as yew (Taxus) and pine are pruned by trimming back new growth in late May and June to control size and increase density in young plants. Maintain the leader in trees.

Broadleaf evergreen shrubs such as rhododendron and holly are pruned in spring to keep the plants in scale for landscape effect.

FRUITS

Tree Fruits

On the home property, tree fruits (apples, peaches, cherries) often are of more value as ornamentals than for fruit production. Years ago commercial fruit orchards were located throughout the State, but are now confined to small areas near large bodies of water or on high areas sur-

rounding the Hudson Valley. Trees growing in less favorable areas may be injured by low winter temperatures and crops are often lost by spring frosts.

A complicated spray program, 10 to 15 sprays per year, often are necessary for adequate disease and insect control. Timing of the sprays is often critical; sprays a day or even a few hours late give poor pest control. Small spray equipment adequate for flowers, vegetables, and small fruits is not adequate for trees. Birds love cherries and cause serious losses. In addition to winter damage and summer pests, trees must be protected against winter pests such as mice, rabbits, ground hogs, and deer. Tree roots on heavy soils often are smothered by standing water in the early spring. Small fruits, therefore, are a much better choice than tree fruits for the home gardener.

Small Fruits

Strawberries, red raspberries, and grapes offer the best chance of success with a minimum of care. Strawberries should not follow tomatoes or potatoes for two or three years because all are susceptible to Verticillium wilt.

Use one-year-old plants. The best varieties for home use are given in table 3. Others for special purposes are listed in catalogs. Set plants as early in the spring as possible.

Strawberries. In setting strawberries, open holes with a trowel or spade and set crowns even with the top of the soil, firming the soil around the roots. As runners develop, space them at least six inches apart, gradually forming a row about two feet wide. Press the runner plant into loosened soil and cover just enough to hold it in place. Cut off excess runner plants, leaving twelve to fifteen runner plants for each of the original mother plants. Keep weeds out with shallow cultivation or hoeing.

In late fall, cover the row with a two-inch blanket of straw. In the spring uncover plants by pulling the straw to the edge of the row to form a much. A new planting every year is best, but strawberries may bear satisfactorily for two or three seasons if weeds are controlled.

Raspberries. After the first year, apply 5–10–5 fertilizer in the early spring at the rate of two pounds per 20 feet of row.

In the early spring, prune to restrict row width to one foot. Thin out the weaker canes so that those remaining are at least six inches apart. Head back the tips to a height of four to five feet. If any side branches are present, they should be headed back to a length of 8 to 12 inches. After the canes have fruited in the summer, remove them to allow unrestricted growth of the newly developing shoots. Sprays for the control of anthracnose, spur blight, and fruit-worm may be needed occasionally.

Grapes. Fertilize as suggested for raspberries. Prune in winter or early spring. The dormant shoots, or canes, grown the past season, produce the next crop and are of the most concern in pruning.

At planting, cut off all but two buds. In the second year, allow only one

cane to grow, and tie it upright to the wire trellis. Remove any fruit shortly after blossoming. In the third year allow two 10-bud canes to remain. In the fourth year and from then on, leave about four canes of 10 buds each at pruning. If the vine is especially vigorous, you may leave twelve or fifteen 10-bud canes; if the vines become weak, leave only two or three 10-bud canes. Always leave two bud-spurs close to the trunk for renewal of canes. Sprays for blackrot and mildew control may be needed occasionally.

LAWNS

New Lawns

Preparing the soil. Seed new lawns in upstate New York about September 1, and near New York City, about two weeks later. Fall seedings are better than spring and give the grass a good start before crabgrass and other summer troubles begin. Prepare the seedbed several weeks before planting time, so the loose soil settles enough to make final grading easier. Soils that stay soggy and wet after a heavy rain need artificial drainage.

Good topsoil is desirable. If you have only subsoil, add four to six inches of good topsoil. All soils, especially sands and heavy clays, are improved by organic matter. For 1000 square feet of new lawn area, use three large (seven and one-half cubic feet) bales, or the equivalent, of peat moss. If the soil has a pH value of less than 6.0, spread ground limestone at the rate of 50 pounds per 1000 square feet. Use twenty pounds of a 10–10–10 fertilizer or other (see table 4) for each 1000 square feet. Do not economize on the amount of fertilizer. To determine the proper rate for single application of any fertilizer, consider only the first figure (nitrogen) of the grade you have chosen.

Table 4. Amount of Fertilizer to Use on Lawns

If the first figure of the grade is	For 1,000 square feet of area	
	of established lawn	of new seed bed or lawn to be renovated
	Pounds	Pounds
4	25	50
5	20	40
6	17	34
7	14	28
8	12½	25
9	11	22
10	10	20

Preparing seedbed and planting. After putting in any necessary drainage and spreading topsoil (if needed, available, and within one's budget), finish rough grading, spread the organic matter, limestone, and fertilizer, and mix them thoroughly with the top four inches of soil. Even distribution is essential; use a wheeled spreader for fertilizer and lime. Repeated mixing with mechanical equipment is best. If only fertilizer is needed, this can be spread on the surface without being worked in.

Rake the seedbed again to produce a smooth surface and pack it lightly with a roller to reveal small bumps and hollows that will need to be leveled off. Rake lightly again and sow the seed evenly, using the mechanical spreader that was used for the fertilizer. After the seed is sown, use just the tips of the rake teeth to cover the seed about one-eighth inch. Go over the area with a roller to firm the soil. If irrigation is available, keep the new seedbed continually moist until a good stand of grass has developed.

A straw mulch is more bother than it is worth on most new seedings except those on steep slopes, those made in late spring, or those on very sandy soil. Be careful not to use too much straw; you should be able to see half of the soil surface through the straw. Remove half of the straw when the grass is three-fourths inch high and remove the remainder a week later.

Kind of seed. The kind of seed you use is most important. Kentucky bluegrass, red fescue, rough bluegrass, and colonial bentgrass should total 80 percent or more in a good mixture. Percentages are on the label. For most lawns, simple mixtures of Kentucky bluegrass and red fescue are adequate where there is no moist shade. Omission of bentgrass is desirable.

For sunny lawns on fairly good soil, Kentucky bluegrass should make up at least 50 percent of the mixture. For dry soils in sun or shade throughout the State and for most lawns, either in sun or shade of Long Island and the New York City area, red fescues should total at least 65 percent of the mixture. Red fescue and Kentucky bluegrass are the backbone of good

lawns, although more expensive than temporary or rough coarse ryegrass and tall fescue. Plant no more than four pounds of a bluegrass mixture or six pounds of a red fescue mixture per 1000 square feet. If you must economize, cut the seeding rate (even as much as one-half) but do not change the quality.

Regular Lawn Care

Mowing. Set your mower to cut at about one and one-half inch height. Start mowing as soon as anything can be cut and continue regularly throughout the year, as long as the grass grows.

Fertilizing. Fertilize in early September. If the soil is poor or the lawn is not thrifty, fertilize again in early spring. Any of the common grades of complete fertilizer is satisfactory if used at the proper rate (table 4). Apply fertilizers evenly with a mechanical spreader or your lawn will have light and dark streaks. To avoid burning the lawn, spread the fertilizer evenly when the grass is completely dry.

Watering. Two or three waterings will keep most lawns fairly green during the average summer if you water when the soil begins to dry out but before the grass wilts. Wet the soil to a depth of five or six inches. Frequent light sprinklings that moisten only the surface do more harm than good.

Rolling. Once a year in early spring go over the lawn with a roller just heavy enough to press the frost-heaved plants back into the soil. Do this before growth starts, when the soil is dry enough to crumble easily in your fingers. Then put the roller away for the year.

Special lawn problems. A lawn that is properly built with adequate lime, organic matter, and fertilizer, and fertilized regularly, has far fewer troubles than one maintained carelessly or one that suffers from early economies at the wrong places. For special problems not covered by this brief description, or for problems of weed control, further information is available from your county agricultural extension service.

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